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TESTS WITH DDT FOR CONTROL OF THE PECAN NUT CASEBEARER IN THE SOUTHEASTERN STATES

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The pecan nut casebearer (Acrobasis caryae (Grote)) is sometimes a limiting factor in the production of pecans in certain areas in the Southeastern States. Most of the injury is caused by the first-generation larvae, which attack the newly set nuts. A single larva may destroy an entire nut cluster. The individual nuts that have been attacked can be recognized by the characteristic borings, or frass, that are cast out by the larvae. The damage is most evident when pecan trees set a light nut crop but may also be severe in heavy crop years. In exceptionally heavy crop years the damage may be more than offset by a beneficial thinning effect due to the destruction of a portion of the nuts.

Field-plot tests conducted at the Pecan Investigations Laboratory, Monticello, Florida, from 1944 to 1947 indicate that the pecan nut casebearer may be controlled effectively and economically with one application of DDT early in the season, when the tips of the young nuts are beginning to turn brown. At this time most of the spring-brood moths have appeared and eggs are being deposited, but few eggs have hatched to produce the young larvae which enter the nuts. Although not considered entirely satisfactory in some portions of the Pecan Belt, this method of timing nut casebearer sprays has proved to be sufficiently accurate for practical purposes in the Southeastern States.

In 1944 sprays containing technical DDT or DDT concentrate at the rates of 1/2 and 1 pound of DDT per 100 gallons of water, with sodium laurel sulfate as a wetting agent, were applied on May 3. Although these formulations did not make satisfactory sprays, 1/2 pound of DDT per 100 gallons gave a 62 percent reduction in the number of infested nut clusters, the 1-pound concentration a 69 percent reduction.

In 1945 tests were made with a commercial DDT-wettable powder and a DDT-pyrophyllite formulation (50-50 micronized) that was prepared by the Bureau of Entomology and Plant Quarantine. Both of these materials made satisfactory sprays. In replicated single-tree plots that were sprayed on April 25 with 4 pounds of the 25-percent-DDT wettable powder

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1/ Consult U. S. Dept. Agr. Farmers' Bulletin 1829, Insects and Diseases of the Pecan and Their Control, for information on the life history of the pecan nut casebearer and a description of its stages.

in 100 gallons of water, the reduction in number of cluster infestations was 93 percent; in plots sprayed on April 26 with 2 pounds of the 50-percent-DDT-pyrophyllite formulation in 100 gallons the reduction was 81 percent.

In 1946 and 1947 a commercial 50-percent-DDT wettable powder was tested in replicated single-tree plots. In 1946 the material was used at the rates of 2 and 4 pounds in 100 gallons of 4-1-100 bordeaux spray. The 2-pound concentration was applied to different series of plots on three dates to obtain information on the degree of accuracy required in timing single applications of DDT for nut casebearer control. In 1947 the material was used with and without a proprietary sticker, at the rate of 2 pounds in 100 gallons of 6-2-100 bordeaux spray. All plots in the 1947 tests also received the recommended scab-control spray program, consisting of four applications of bordeaux mixture. The results of these tests are given in table 1.

Table 1.--Field-plot tests with DDT for control of the pecan nut casebearer in 1946 and 1947

Pounds of 50-percent-DDT wettable powder in 100 gallons of bordeaux spray	Date of application	Reduction in cluster infestation	Nut yield per tree	Increase in nut yield per tree
		Percent	Pounds	Pounds
	1946 Tests			
2	April 27	89	35.7	5.7
	30	85	38.2	8.2
	May 2	97	45.9	15.9
4	2	97	50.6	20.6
None	-	-	30.0	-
	1947 Tests			
2 (with a sticker)	May 13	89	13.5	10.4
	15	85	11.9	8.8
2 (without a sticker)	15	84	9.5	6.4
None	-	-	3.1	-

Each of the treatments in 1946 gave good control of the pecan nut casebearer, with corresponding increases in yield of nuts per tree. The results indicated that 2 pounds of 50-percent-DDT wettable powder per 100 gallons will be reasonably effective when applied at any time during a 6-day period after the tips of the nuts begin to turn brown. They also suggested that the period during which effective spraying with DDT is possible may be even longer, since all the treatments gave good control. Under comparable conditions, 2 pounds of the wettable powder gave approxi-

mately the same control of cluster infestations as 4 pounds.

The 1947 tests confirmed the promising results obtained in previous years and indicated that the addition of an adhesive or sticker adds little, if anything, to the effectiveness of a DDT spray for nut casebearer control.

A large field test with a commercial 50-percent-DDT wettable powder, in combination with 6-2-100 bordeaux mixture, was also conducted in 1947. The test orchard contained 13.5 acres of the Moore variety of pecan and 8 acres of the Moneymaker variety. The entire orchard received the recommended pecan scab control program. The 50-percent-DDT wettable powder was applied at the rate of 2 pounds per 100 gallons of bordeaux spray on May 12-13. The check plots containing 2 1/2 acres were sprayed with bordeaux only.

The reduction of cluster infestation below that in the untreated trees was 84.5 percent on the Moore variety and 93.2 percent on the Moneymaker. The treated Moore trees yielded 31.7 pounds of nuts per tree, or an increase of 9.5 pounds over the check, and the Moneymaker trees yielded 24.7 pounds, or 11.1 pounds per tree more than the check. These results were additional evidence of the effectiveness of DDT in controlling the pecan nut casebearer and increasing nut yields.

Following the application of DDT in the orchard experiment, an infestation of mites (Tetranychus sp.) developed, possibly because of the effect of DDT on the predators that normally hold mites in check. These mites caused considerable defoliation on the Moore variety of pecan. However, the increase in nut yields resulting from the control of the nut casebearer more than offset the cost of the sprays that were required to eliminate the mite infestation.

On the basis of 4 years of experimental work, 2 pounds of 50-percent-DDT wettable powder in 100 gallons of water or bordeaux mixture is tentatively recommended for pecan nut casebearer control in the Southeastern States. A single application should be made when the tips of the small nuts are beginning to turn brown. If a leaf scorch that is caused by mites appears in DDT-sprayed orchards, a 1-percent summer oil emulsion or some other recommended material should be applied at once. Where mite infestations are heavy, a second application 7 to 9 days after the first may be required.

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